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# Remittances and Asset Accumulation of Household in Pakistan

By

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## Abstract:

*Assets accumulated by household is important topic, it is investment by household to maximise their utility for present time and for future. It is stock investment which help the household to use these assets in tough time. How income receive to household from three sources i.e. labour income, internal remittances, and external remittances effect assets accumulation of household is the topic for investigation in this paper. This paper analyses the effect of remittances on aggregate household's assets of Pakistan by using Probit model estimated through maximum likelihood method. Finding of this paper shows that external remittances positively and significantly affect assets accumulation of aggregate household of Pakistan. Results of the paper are closest to theoretical idea that remittances have significantly affect the asset accumulation of household.*

**Key words:** *Assets Accumulation, Utility, Internal Remittances, External Remittances, Households, Pakistan, Probit Model.*

**JEL Classification:** *C25, D10, F22, F24, R20*

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## **1. Introduction:**

Investment is important part of income of household. Household invest in different ways i.e. education, health, assets etc. Household invest in Assets to maximise their utility in current period of time and for future time period, for themselves and for their future generation. Investing in assets is stock investment which household made investment when time is good and sell these assets when time is tough.

Holding assets is household phenomena that depends on the how forefather behaving to their future generation. If they have broken chain or any of their generation is childless or if they are unsympathetic to their beneficiary so they will not hold/accumulate assets and will increase consumption today. Parents' utility is depending on size of their children so if they are more concern to their children's utility. They will save for their generation or accumulate assets for their heir. There is also another possibility that forefathers are less concern to their grandchildren, they are of view that their children or grandchildren may be more well off then they are, that is why they will not save or accumulate assets (Tobin, 1980).

Household have different sources of income, important source is labour income but if household do not get better opportunity of earning income at home so it migrate to some other place or some of member move to that place where they get better opportunity of work and income. Household surveys in developing countries show that remittance-receiving households have greater access to primary and secondary education, health services, information and communication technology, and banking than those households that which do not receive remittances.

Pakistan is one of those countries which have highest Diasporas in the world. Amount of Pakistani Diasporas reach to 7.1 million in 2015 all around the world. That is why Pakistan became 7<sup>th</sup> largest country in term of remittances receiving countries of world (World Bank 2015).

There are some more reasons of increase in remittances i.e. Pakistan remittances initiative (PRI), inflow of remittance through formal channel then informal channels etc. Remittances are important for Pakistan at macro level as well as at micro level.

At macro level it help the country to reduce poverty, improving GNP of country and help the country to repay the debt. At micro level it help the household to improve the education of their children, improving health and get awareness about health and those household which receive remittances devote more their resources to investment purposes. Effect of remittances on household welfare is positive.

According to World Bank report (2015) South Asia is world largest remittance receiving region of world. Pakistan stand 1<sup>st</sup> in term of percentage of reserves and 4<sup>th</sup> in term of percentage of reserve of GDP to remittances in South Asia.

Pakistan receive most of remittances from gulf countries including Saudi Arabia, United Arab Emirates (UAE) and also from United States, United Kingdom, etc. These remittances help country to overcome huge debt. Household which receive remittances have more consumption on day to day transactions but they also spend on durable goods which help them to overcome the uncertain situation in future. Household spend on assets e.g. property, land, small enterprises etc. Migrant is living outside the country so he always want to spend his money into save business or invest where loss of money is minimum. Investing in assets which help household in future and maximise their utility today are an important topic which need to be investigated that how remittances effect these assets.

Objective of paper is to analyse the effect of remittances on aggregate household of Pakistan. A few studies have been done on this issue i.e. Adam (1996), Adam (1998) and Siddiqui (2013) in Pakistan. Micro level studies are rare in this topic especially for Pakistan. This paper will try to capture the effect of remittances at micro level i.e. household.

In order to identify this issue we will use probit model and maximum likelihood estimation technique will be used because household decision to accumulate assets have binary choice.

## **2. Literature Review**

How household consume or invest their remittances is lively debate now. Different studies done in different time period tried to capture the effect of remittances on household life. Studies done by Ratha (2005), McKenzie (2005), Yang (2008), Ojapinwa and Odekunle (2013) by using different econometric models show that remittances positively affect the investment of household. These studies showed that remittances are spend on mostly on investment in education and health.

Ledesma and Piracha (2004) and Adam et al. (2010) found that remittances are used for investing purposes, mostly invested in human and physical in assets. They also found that these remittances help to reduce the unemployment of country which receive remittances. Yang (2011) measured that household which receive remittances spend them in assets when time is good and sell these assets when time is bad. Meckenzie (2005) in Mexico, Adam and Cuenquecha (2013) in Ghana measured that remittance invested by household in education and for their health and housing.

Ojapinwa and Odekunle (2013) in Nigeria, Dorantes and Pozo (2014) from Mexico, and Randazzo and Piracha (2014) in Senegal, found from their studies that remittances help the household in investing in different ways i.e. education, in food,

lasting good, in ceremonies. Chiteji and Stafford (1999) in African-America families found that different characteristics of household like education, income, dependency ratio on household head can influence the accumulation of assets. Dustman and Mesters (2010) found household decision for return to origin effect the holding of assets, if they have will to return so they will invest more in assets at origin.

Studies in Pakistan also shows importance of remittances. First survey for migration and remittance data collection was done in 1981 by Gilani et.al. Another study by Nishat and Bilgrami (1993) showed that remittances are invested in accumulation of property. Adam (1996, 1998) found that external remittances are more important for household for investing in land, property and livestock. Siddiqui and Kemal (2006) also discovered importance of remittances for household goods like gas, electricity, telephone, consumption in durables and non-land assets. Awan and Javad (2015) found household which have migrant member enjoy better health, food, non-food, and electronics.

### 3. Data

For capturing the effect of remittances on household assets we are using survey data which was conducted by Pakistan Bureau of Statistics, named as Pakistan Social and Living Standard Measure (PSLM) data for year 2012-2013. PSLM is country wide representative survey which contain 75516 household. Survey was conducted from more than hundred districts of Pakistan for social demographic and economic indicators. Questionnaire of survey contain specific sections for variable for getting full information about different variables at household level. Both urban and rural household were included in this survey. There are 65 percent rural household and 35 percent urban household included in data. Out of 75516 household 4476 receive external remittances and 7782 household receive internal remittances. If we look at the gender head of household 92% household have male head.

**Table 1: Summary Information of Data**

Total household	75516
Rural household	48918
Urban household	26598
External remittances receiving household	4476
Internal remittances receiving household	7782
Female Household head	6095
Male household head	69421

Household which receive remittances have female head as 27% household which receive external remittances have female head and only 4% household have male head which receive external remittances. Internal remittances receiving

household which have female head are 41% and only 7% household which receive internal remittances have male head. If we consider the Education of household head we see that 48% of head are literate and illiteracy ratio is higher in female head than male head. Our dependent variable is assets, this data shows that 14217 household, which is almost 19 % of household, have positive response for assets accumulation that their assets are now in better condition than last year. Out of which 875 household receive external remittances and 2288 receive internal remittances. These information are shown in table 1 and 2 as given below;

**Table 2: Data Summary Information in Percentage (%)**

Female head receiving external remittances	27%
Male head receiving external remittance	4%
Female head receiving internal remittance	41%
Male head receiving internal remittances	7%
Household with external remittances and assets	19.50%
Household with internal remittances and assets	30%

The summary statistics in table 3 shows that average of income each household in Pakistan receive Rs.231794 annually. Average of external remittances is Rs.14353 which shows that each household have average receiving remittances. Internal remittances have Rs.10601 means each household of Pakistan receiving this amount.

**Table 3: Summary Statistics of Variables**

Variables	Average	S.D
Income	231794.34	437795.0196
External remittances	14353.62	84474.6384
Internal remittances	10601.47	51131.24739
Age	45.61	13
Education	1.46	0.933702813
Male over 15 years	1.93	1.25
Member under 15 years	2.8	2.14
Member over 15 years	3.71	1.93

Average age of household head in Pakistan is 45years, and education average is 1.46. As we coded primary level education as 1 and 2 for matric so 1.45 means that education average is below eight grade for household head. Average of male over 15 years in household of Pakistan is 2. Household member under 15 years in household of Pakistan is 3 and member above 15 years is 4. Looking at the different reports and surveys of Pakistan which shows that average household size of Pakistan is 6 and our

statistics follow this information. Standard deviation of variables shows that how much the values disperse from their mean.

#### 4. Methodology

For measuring effect of remittances on assets we will use the function given by Deaton (1992) that utility of consumer consumption pattern depends on information available to consumer at that time period. If consumer get information that he have more return now than future than he will consume today or if return is greater in future than today so he will invest today for future return.

$$U_t = E \left[ \sum_t^T v_t(C_t)/I_t \right]$$

This idea is adapted by Adam (1998) for his study for Pakistan, and now we can use that Probit model for our study i.e.

$$A_i = f(Y_i, IR_i, XR_i, M_i, HHMU15_i, HHMO15_i, AgeHH_i, EDU_i, DG_i, RD_i, \mu_i) \quad (1)$$

Whereas;

$A_i$  = Household Assets Accumulation (Measure as binary variable such as; 1= Assets Accumulation during the year and 0= Assets Not Accumulated the during year)

$Y_i$ = Labour Income in Rupees

$IR_i$ = Internal Remittances in Rupees

$XR_i$  = External Remittances in Rupees

$M_i$  = Number of Males over 15 Years of Age

$HHMU15_i$  = Household Member under 15 years of Age

$HHMO15_i$  = Household Member over 15 years of Age

$AgeHH_i$  = Age of Household Head

$EDU_i$  = Education of Household Head

$DG_i$ = gender of Household Head (Measures as binary variable such as; 1= Male Household Head and 0= female Household Head)

$RD_i$  = Region Area of Household (Measured as binary variable such as; 1 = Rural and 0 = Urban)

$\mu_i$  = Error term

$$\mu_i \sim N(0, \sigma^2)$$

We are taking our dependent variable as binary outcome i.e. (0,1) that is why we are using Probit model for our study. Functional form is made as follows;

$$Probability(A_i = 1|y_i, XR_i, IR_i, M_i, HHMO15_i, HHMU15_i, AgeHH_i, EDU_i, RD_i DG_i)$$

Here we will use Probit model (Bliss, 1934) as our econometric model because it is more attractive after *linear probability model* and of course our sample size is large so Probit model will give better results than any other binary outcome dependent variable model.

In the comparison with linear probability model,  $y_i^*$  (conditional on X) is normally distributed in the Probit model, though its realization  $y_i$  is not. Now we can generate our Probit Model

$$A_i = \begin{cases} 1 & \text{if household accumulate asset} \\ 0 & \text{otherwise} \end{cases}$$

Accumulation of assets is positive which we use here, all those households which attain assets in last twelve months, if household have assets in more than one form we will give them value "1".

As Probit model has symmetric distribution so we can write as;

$$= \Phi \left( x_i \frac{\beta}{\sigma} \right) \quad 3$$

Now we have following model for our study;

$$A_i = \beta_0 + \beta_1 y_i + \beta_2 IR_i + \beta_3 XR_i + \beta_4 M_i + \beta_5 HHMU15_i + \beta_6 HHMO15_i + \beta_7 AgeHH_i + \beta_8 AgeHH_i^2 + \beta_9 edu_i + \beta_{10} DG_i + \beta_{11} DR_i + \mu_i \quad (2)$$

Where;  $\mu_i \sim N(0, \sigma^2)$

Household were asked in questionnaire about their accumulate asset in twelve months that whether they accumulate assets or not, if yes then condition of asset is better than previous year so value "1" will be given that is why our dependent variable is binary. " $\beta_0$ " is constant term whereas the other " $\beta$ "s are coefficients of independent variables will show association with assets.

Probit model will be estimated through maximum likelihood (Fisher, 1922). Pseudo R square will be used to check the goodness of fit of model. Pseudo R square can be define as it compares the value of likelihood of estimated model to the value of likelihood when none of independent variable is included as predictor.<sup>4</sup> Log likelihood will be used for significance of estimated model. Using chi square test,

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<sup>3</sup> Johnston, J. and J. DiNardo (1997). Econometric Methods, Cambridge Univ Press.

<sup>4</sup> Introduction to econometrics (James.H.Stock, 2003)



with assumption that all coefficients except intercept are zero, to check at which degree our model is significant.

## 5. Estimation

We have estimated the Probit model for the effect of remittances on the household assets in Pakistan using PSLM (2012-13) data by Maximum Likelihood Method. The estimated model is presented in Table 4;

**Table 4: Analysis of Aggregate Household Assets Accumulation of Pakistan**

Variables	Coefficients	z-stats	Marginal coefficients
Income	3.66E-08	3.04***	9.61E-09
External Remittances	0.000000176	3.24***	4.63E-08
Internal Remittances	7.02E-08	0.69	1.84E-08
Gender of head	0.1939185	8.47***	0.04711
Age	0.0119846	4.88***	0.003147
Age <sup>2</sup>	-0.0000774	-3.16**	-0.0000203
Education	0.0181379	2.79***	0.004763
Number of males over 15 years	0.0146514	1.82*	0.003847
Household member under 15 years	0.0176408	6.88***	0.004632
Household member over 15 years	0.0380728	7.33***	0.00999
Region	0.4644018	36.58***	0.12194
Intercept	-2.489	-36.96***	
<b>Diagnostic Test</b>			
Log Likelihood	-35381.532		
$\chi^2_{(11)}$ test for joint significance	2286.91***		
Pseudo R <sup>2</sup>	0.0313		
N	75507		

Pseudo R<sup>2</sup> value is used to check the goodness of fit of estimated model. Log Likelihood Ratio test is used for significance of estimated model by applying the null hypothesis that all coefficients of independent variables except intercept are zero. The  $\chi^2_{(11)}$  value indicates that the estimated model is significant at 5% level.

Explanatory variables for estimated model, external remittances, income of household, education, member in household under and over 15 years, male in household over 15 years of age, gender of head, age and age square and regional effects are significant by using Z-Statistics at 5 percent level. Variable Internal remittances is insignificant. As may be seen the signs of coefficients of variables are according to the a priori expectations.

Income of family have positive coefficient and significant, marginal coefficient is  $9.61 \times 10^{-9}$  and can be explain as probability of assets will increases by  $9.61 \times 10^{-9}$  units. Previous studies shows that income have positive effect on assets (Adam, 1998, Adam and Cuecuecha, 2010, Manner, 2011, Chiteji and Stafford, 1999).

External Remittances have positive and significant association with assets accumulation. Marginal coefficient of external remittances is  $4.63 \times 10^{-8}$ , shows that increase in probability of assets by  $4.63 \times 10^{-8}$  units or 0.00000463 percent chances of increase in assets as remittances from abroad increases. Studies done by Stark, 1980, Lucas, 1985, Adam, 1998, Chiteji and Frank P. Stafford, 1999, Cuecuecha and Adam, 2010, Dorants and Pozo, 2014 found positive relation between assets and remittances receiving. Internal remittances have positive coefficient means that association with assets is positive but as z-statistics is insignificant so their conclusion has no sense. Other variables as Education and age of head have significantly positive link with accumulating assets. Increase in education will increase 0.004763 probability or 0.4763% chances of increase in assets.

Age has 0.00315 as marginal coefficient and age square is -0.0000203 which can be explain as age of head have positive effect on assets of household but as age of household head increased after a definite age it effect the probability of assets negatively, as Life Cycle Income Hypothesis (1963) infers that negative saving in old age significantly reduces assets. Literature also explicate that household head is younger then he will accumulate more assets than older household head. Male in household over 15 years of age have significant and positive marginal coefficient. Male over fifteen years of age increases in house then there are 0.385 percent more chances of holding assets for household.

Another household characteristics which we use is family member over 15 years have positive relationship. It has marginal coefficient, 0.009997 which shows that the member over fifteen years in household increases it increases the probability of accumulation of assets significantly by 0.009997 or 0.9997 percent. Member under 15 years has 0.004632 as marginal coefficient, which also shows that chance of household rises significantly by 0.004632 or there are 0.4632 percent chances to accumulate more assets as the family member under 15 years increases. As family having male head, it have significantly positive impact. Head of household is male, probability of holding assets will significantly surges by 0.04711 or 4.711 percent chances of increase in assets as having male head. Region of Pakistani household is significantly important that rural household have 0.12194 chances to accumulate more assets.

Previous studies i.e. Barrett (2001) enlightened that education increases non-farm earning and education assistance them to enter in to barrier of high giving nonfarm service. Adam, 1998, Chiteji and Frank P. Stafford, 1999, Schmidt and

Sevak, 2006 illuminated that education of head of household, gender of household head (male) have positive influence on accumulating assets.

## **6. Conclusions**

For finding the effect of remittances on household assets accumulation data of PSLM (2012-13) has been used and data of all interviewed households in survey has been used, those which received remittances and those which did not receive remittances. By using bivariate response, Probit model estimated by maximum likelihood had been used. Remittances are taken in two types i.e. internal and external, and labour income distinctly had aimed to specify influence of wholly three kinds of income. Those Household characteristics which could affect assets accumulation were also used as independent variable.

Maximum Likelihood Method is used for estimating Probit model for this study because dependent variable is binary i.e. value “1” is assumed if household account its economic condition of assets is better or much better than previous year and zero otherwise. This study presented important outcomes for Pakistani households that external remittances are important and have significant part in their enlargement.

Conclusion of study display that external remittances play a key role in family life of Pakistan. Assets accumulation of household is significantly affected by external remittances, remittances which household receive internally also have positive impression on holding of assets but that effects is not significant. Household characteristics income, gender of head, age of head and dependence on household are having significant role in accumulation of assets. Prominence of external remittances for Pakistan could not be ignore, which stand 7<sup>th</sup> in world according of receiving remittances.

From the above study and conclusion we can suggest to policy maker to not ignore the importance of remittances specially in developing countries like Pakistan, and it is suggested that Government of Pakistan should emphasis on raising the awareness of households for remittances to invest in productive drives, which would support to have long duration positive impression not only on economy but on socio-economic life of households of Pakistan.

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